

# NASA TECH BRIEF



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## Automatic Planning Concept—An Analysis of Optimum Scheduling

Due to the uncertainties and intangibles involved with a space project that includes a multiplicity of sophisticated scientific experiments, it would be most beneficial if an optimum schedule could be developed by the use of linear programming. To this end, a study in depth has been made, which considers resource costs, mission constraints, and experiment results as linear functions, insofar as possible. Elements not amenable to such consideration are identified and discussed. The problem of introducing time or scheduling into linear programming has, in the past, been resolved by an algorithm that generates acceptable but not optimum schedules within a specified set of resources and logical restraints.

The study is deeply involved with a mathematical approach in which a number of constraints are considered operative: constraints relating to manpower, equipment, raw material, electrical energy, etc.; others relate to exterior parameters, as geographical areas to be monitored, or meteorological phenomena to be sampled at discrete altitudes; still others relate to experiments which must be performed in a specific sequence. The principal effort in these considerations is, therefore, a realistic mathematical model.

### Notes:

1. Many industrial scheduling problems may be resolved by a similar approach. For example, scheduling of the design, development, production, and sales of products; the purchase and proper installation of capital equipment, or the orderly diversification into new marketing areas.
2. Inquiries concerning this innovation may be directed to:

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Reference: B68-10127

### Patent status:

No patent action is contemplated by NASA.

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